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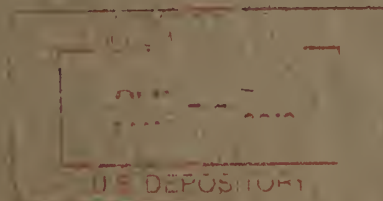
FOREST PRODUCTS LABORATORY

In cooperation with the University of Wisconsin

MADISON, WISCONSIN

FOREST LANDS AND FOREST INDUSTRIES

By CARLILE P. WINSLOW
Director



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FOREST LANDS AND FOREST INDUSTRIES

By

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Markets for forest products are the neck of the industrial bottle through which forest lands may materially contribute to our economic development. It is because of the magnitude and diversification of such markets that we have been able to develop upon our unparalleled timber resources enormous industrial, financial, and territorial activities, which in capital invested, value of products, and labor employed rank collectively in the foreground of our national developments. It is upon the stability of such markets that rests the security of the millions of dollars invested in timber and timber lands, logging equipment, mills, wood-working factories, wood-preserving plants, naval-stores operations, railroads, wharves, ships, banks, stores, roads, schoolhouses, and dwellings, and, of equal or greater importance, the security of a yearly labor payroll of one and one-fourth billion dollars aggregate for over 1,110,000 men in America's forest industries, including pulp and paper.

The successful continuation and future development of these gigantic and ramified economic interests are being threatened by the declining consumption of lumber.

Had the per capita lumber consumption from 1899 to 1909 continued, the 1929 gross consumption would have been almost twice what it was in an era of prosperity and building activity never reached before (1930-29), when the consumption of all other major building materials was greatly increased. Gross lumber consumption actually decreased, however, and enlargement of wood consumption for pulp, paper, and other uses has by no means replaced in volume the shrinkage in lumber consumption.

This reduction in markets for lumber since 1903, when a peak in lumber consumption was reached, has not been due to a reduction in potential outlets for lumber. Although the large expansion in farming with its lumber requirements for buildings began to fall off at about that time, industrial development increased at such a rapid rate

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thereafter that there was no dearth of potential opportunities for the use of lumber. Neither had the price of lumber increased to such an extent that it had become prohibitive for general construction purposes. With neither potential outlets nor price standing in the way, what is it that has caused a severe decline in lumber consumption in the face of an increase in population and in industrial development? The answer lies largely in that wood and other forest products have not kept pace with the development of other competing materials.

Uses long held by wood have been contested both by old materials refined by science and by new materials of scientific origin, promoted in industry with the aid of extensive technical knowledge of their properties. Metal lath and window sash, synthetic boards, all-metal automobile bodies and airplanes, steel desks, metal doors and trim, composition floors, concrete bridges and piling, asbestos and tile roofing, metal poles and posts, petroleum paint thinners, synthetic wood alcohol -- these are but a few illustrations of the prevailing tendency toward substitution. The real and constant quest of modern Americans for technical progress and improved products and service are factors that must be candidly faced. If in the case of any material, wood included, it is assumed that it will stand for all time on the strength of its past and present state of perfection, there is almost a certainty, because of the increasing interchangeability of materials, that its use will steadily diminish.

A review of the facts and tendencies of the market situation leads to the inevitable conclusions that our requirements for forest products in the future will not be what they have been in the past, either in form or quantity; that it cannot be taken for granted that because per capita consumption of forest products has been high in the past it will automatically so continue in the future; that new forms and economies in the use of the basic raw materials, such as are represented by notable developments during recent years in steel-skeleton construction, veneered coverage, and large-size structural units of light weight, may upset the most exact predictions based on past experience; and that there is an important distinction between the need for wood as a cheap raw material for conversion by industry into salable commodities in a highly competitive field, and wood or forests essential in themselves for other purposes.

Once recognizing these conditions, we may turn attention to ways and means for retaining, recapturing, and expanding markets for forest products. This will require

persistent and unflagging accomplishments in four distinctive fields: First, a lowering of costs to the consumer; second, an increase in satisfaction in the use of the product through improvement of properties and qualities; third, the development of new products or modified products; and, fourth, the promotion of popular acceptance and use of the products by all legitimate contributory means that may be effective.

The development and application of whatever measures are necessary to make progress in these fields are the concern of both private industry and the public. Let us consider a few of the outstanding opportunities for progress toward these ends.

Markets for a material are dependent primarily upon its cost and the service that it will give. Industry can cut costs in a number of ways. Integration of various forest products industries such as lumber, dimension stock, and pulp, at central points so that each species, size, and quality of wood may be most efficiently handled and fabricated, and waste and handling reduced to a minimum, although already partly under way, offers many opportunities for reducing costs.

Instituting accurate cost keeping systems will show up unprofitable operations and help in lowering production costs. As an example, it has been convincingly established through cost studies by the Forest Service in every producing region that the smaller timber for a region is handled at a loss in most lumber operations. In southern pine, the small trees are often cut at a loss of approximately \$10.00 per M which adds to the price at which the larger timber must be sold to yield a profit.

Transportation charges, which always are a large item in lumber merchandizing, can be reduced by better drying of lumber at the mill, cutting out defective material at the mill as far as possible, avoiding excessive overlapping of shipment ranges from different territories, and, in a large range program, by growing forests nearer the centers of consumption.

Costs can also be cut by the adoption of modern methods in construction and fabrication. Mass production and factory assembly so as to avoid slow and costly handwork are almost virgin fields in wood construction.

The matter of eliminating waste in logging, milling, fabrication, and pulping offers tremendous opportunities for reducing costs on account of the large amount of material which is wasted under present methods.



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Improving the service given by wood products is one of the best means of assuring a continuing market in competition with other materials. Sills decay, floors show wide shrinkage cracks, doors warp, furniture comes apart at the glue joints, siding discolors and blisters paint, packing boxes open up in transit, and fires originate in unprotected wood near chimneys. All of these undesirable happenings, however, are not basically the fault of wood, but of the manner in which it is used. Enough is known about preventing decay, reducing shrinking and warping, making strong glue joints, designing packing boxes, etc., to prevent many of the unfortunate failures of wood in service. Much more needs to be known, however, if wood is to continue to compete successfully with some of the newer materials in the construction and fabricating fields.

Rule-of-thumb methods have carried developments in these fields about as far as can be expected except for occasional findings. Further progress on a large scale must be looked for along technical lines. Technical knowledge itself must widen and deepen or its application in reducing costs, improving quality, and developing new uses will reach a level beyond which further progress is slow and intermittent. The continuous development of new facts and principles through research is the only sound basis for substantial progress.

Improved design of wooden structures so as to economize on material without impairing their strength and to permit of factory assembly and mass production, requires greater refinement in our knowledge of the wood. The effect of defects in different locations, of the orientation of the annual rings, and of changing moisture content; the holding power of nails, screws, and bolts; and the efficacy of perhaps entirely new methods of fastening members together need to be known. This requires research in the fields of timber mechanics, timber physics, wood technology, and wood chemistry.

Improving the usefulness of lumber through better grading and selection, making paint stick better to the hard summerwood of softwoods, developing cheap methods of making glue joints permanent, finding out cheaper and simpler ways of making wood fire resistant, reducing shrinkage in wood, preventing the raising of grain in finished softwood and hardwood lumber, devising new methods for seasoning refractory woods, which check, warp and collapse badly, hardening the surface of softwoods so that they will better resist wear and indentation, redesigning wooden structures on a scientific basis so as to eliminate weak and undesirable features, and improving wood-working machinery and methods,

are some of the many problems that need research in order to increase the satisfaction that wood may give in service.

A big field for the increase in markets for forest products is in the development of new products from them. Although plywood has been known for a long time, its relatively recent increase in use has made it virtually a new product for many purposes. More needs to be known about its technical properties, such as behavior under stress, shrinkage, and stability as affected by the thickness and number of plies. Built-up beams, columns, and laminated arches, although also not new products, will probably see much greater use in the future and need technical data for their efficient development.

Probably the largest expansion in the market for wood will be in fibrous and chemical products. The "synthetic board"; molded products to be used in furniture, electrical equipment, novelties, etc.; the derivatives of cellulose, as nitrates, acetates, and perhaps many new products; the compounds of lignin, about which relatively little is known; and the extraction of the other minor but highly diversified constituents of wood, open up a field whose possibilities can be compassed only by a liberal imagination.

Lack of stability in prices is another source of demoralization in markets for forest products. Lumber, newsprint, and naval stores suffer alike from a fluctuating market. The periods of high lumber prices have been at the sacrifice of the good-will of the buying public, have brought about the substitution of inferior material which has not given satisfaction and have opened the way for competing materials. Rapidly receding lumber prices, on the other hand, act to retard buying. The stabilization of prices through controlled production, legislation, and other means has been one of the chief concerns of the lumber and naval stores industries during the past decade, but so far little progress has been made.

Although sound principles for the economic use of forest lands and stabilization of forest industries must largely be applied by industry, the public is vitally concerned both with their development and their successful application. Aside from the loss of revenue from timber lands that the public itself owns when they are not producing to their maximum capacity, the public foots the bill for private lands which are idle for lack of markets in such items as costs of governmental supervision, roads, tax delinquency, fire hazard, long freight hauls of lumber from other regions or countries, more expensive substitute

materials, lack of water-shed protection, erosion and silting of streams, and loss of wild life and recreational facilities.

Once it is realized that forest lands are a matter of public concern, such matters as equitable taxation, tariffs technically sound building codes, fair legislation for adjusting production to requirements, and the expansion of research in timber growing and the utilization of forest products should find ready public support.

The public has lifelong familiarity with and attachment to wood and wood products. The nation has a vast program of forestry at stake in the trend of wood consumption. The fiscal stability of local governments is bound up with profitable use of the land. The weight of public opinion will be a mighty factor that may well be cultivated in stabilizing forest production and safeguarding forest markets.

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